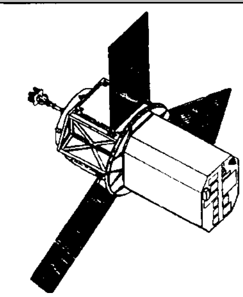
SMM
Solar Maximum Mission

Spacecraft Sketch	Mission Objective
	The Solar Maximum Mission (SMM) objectives are to: 1) observe flares and flare-induced effects in the chromosphere, chromosphere-corona transition region and corona; 2) determine fundamental characteristics of solar plasma in the upper chromosphere, transition region, and inner corona before, during and after solar flares; 3) study coronal evolution at solar maximum and examine coronal transient activity; 4) determine temperature and density structure of high energy flare plasma as a function of space and time; 5) investigate position, structure and thermodynamic properties of hot thermal and non-thermal sources in flares and active regions; 6) observe high energy solar x-rays to determine properties of electron acceleration; 7) determine spectral and temporal history of proton acceleration in flares: and 8) measure total and spectral irradiance of the sun.

TYPE OF MISSION	PROGRAM OFFICE	PROJECT LEAD CENTER	MANAGEMENT APPROACH	S/C CONTRACTOR	I&T CONTRACTOR
SPACE PHYSICS	SPACE SCIENCE	GSFC	AUGMENTED HYBRID	GSFC IN-HOUSE	GSFC IN-HOUSE

Payload Description
The Solar Maximum Mission (SMM) observatory consists of two major elements: 1) a Multimission Modular Spacecraft (MMS) and 2) SMM mission unique elements. The MMS spacecraft provides the essential support subsystems which maintain the overall functioning of normal spacecraft activities. The mission unique elements include the experiment module containing the instrument complement and associated electronics, the solar array, RF antennas and launch vehicle adapters. The MMS spacecraft is a NASA standard on-orbit serviceable bus that consists of modular support structure (MSS) and functional module hardware. The functional module hardware includes a Modular Power Subsystem (MPS), a Signal Conditioning and Control Unit (SC&CU) a Communications and Data Handling (C&DH) Subsystem, a Modular Attitude Control Subsystem (MACS), and a Propulsion Module (PM) with an auxiliary tank.

INSTRUMENT NAME	ACRONYM	PI AFFILIATION	PRINCIPAL INVESTIGATOR	I&T CONTRACTOR
ACTIVE CAVITY IRRADIANCE MONITOR	ACRIM	JPL	R. C. WILLSON	JPL
GAMMA RAY SPECTROMETER	GRS	UNIV NH	E. L. CHUPP	UNIV NH
HARD X-RAY BURST SPECTROMETER	HXRB	GSFC	K. J. FROST	GSFC
HARD X-RAY IMAGING SPECTROMETER	HXIS	SRL	C. DE JAGER	SRL
ULTRAVIOLET SPECTROMETER & POLARIMETER	UVSP	MSFC	E. TANDBERG-HANSSEN	GE
WHITE LIGHT CORONAGRAPH/POLARIMETER	WLCP	HAO / NCAR	L. HOUSE	HAO/NCAR
X-RAY POLYCHROMATOR	XRP	LPARL	L. W. ACTON	LPARL

Instrument Descriptions
The SMM Active Cavity Radiometer Irradiance Monitor (ACRIM), Data Point 664, is designed by the Jet Propulsion Laboratory to measure the total solar irradiance with high accuracy and precision, less than half of a percent, to determine the magnitude and direction of variations in the total solar output of optical energy.
The SMM Gamma Ray Spectrometer (GRS), Data Point 580, is designed and built by the University of New Hampshire to study the solar flare/particle acceleration phenomena. The instrument uses seven high resolution sodium iodide integral line detectors to cover the range from 0.3 to 9 MeV and a thick cesium iodide crystal to detect gamma rays above 10 MeV.
The SMM Hard X-Ray Burst Spectrometer (HXRB), Data Point 583, is designed to investigate the characteristics of particle acceleration and determine the role of the accelerated particles in the solar flare process. The instrument consists of an anticoincidence shielded cesium iodide scintillator to measure X-ray bursts in the 20 to 300 KeV range. The instrument is developed and built in-house at GSFC.
The SMM Hard X-Ray Imaging Spectrometer (HXIS), DPN 578, consists of an imaging collimator and position sensitive detector system operating in 6 energy channels. The grid collimator has a total of 512 image elements: 1) 304 fine elements (8 x 8 inches) with a 2-foot 40-inch diameter field of view (FOV); 2) 128 coarse elements (32 x 32 inches) with a 6-foot 24inch diameter FOV; and 3) 80 slit elements (16 x 384 inches).
The SMM Ultraviolet Spectrometer and Polarirneter (UVSP), Data Point 581, is designed and built by General Electric to study the physical conditions of the coronal active regions and flares. The instrument uses a Gregorian telescope and an Ebert spectrometer to obtain high resolution spectroscopy to measure temperature, density, velocity and magnetic fields by measuring line intensities and line profiles in the spectral region 1100 to 3000 angstroms. Technology inheritance is from the OSO-8 UV Spectrometer, Data Point 126.
The SMM White Light Coronagraph/Polarimeter (WLCP), Data Point 582, is designed and built by BASD to observe the dynamics and structure of the solar corona at solar maximum. The instrument is based upon the simpler Skylab White Light Coronagraph (S052), Data Point 137, which is also built by BASD.
The SMM X-Ray Polychromator (XRP), Data Point 579, is designed and built by Lockheed Missiles and Space Company to study X-ray emissions from pre-flare, flaring and post-flare plasmas. The instrument consists of two spectrometers, a Flat Crystal Spectrometer and a Bent Crystal Spectrometer. The Flat Crystal Spectrometer uses seven collated crystal spectrometers with a spatial resolution of 10 arc seconds. The Bend Crystal Spectrometer uses 8 fixed crystal spectrometers with a spatial resolution of 6 arc minutes.

Launch
2/14/80